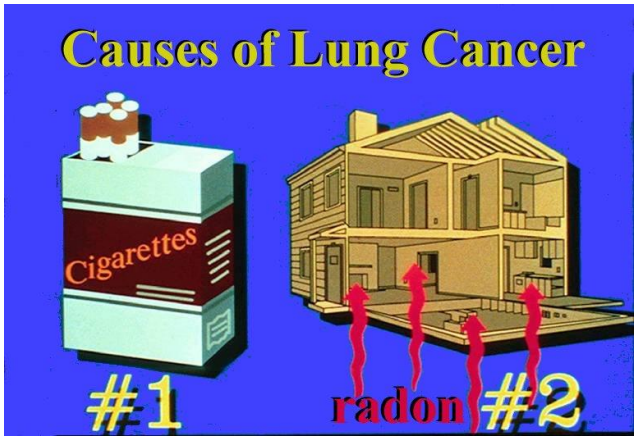
no color

no odor

What is radon?



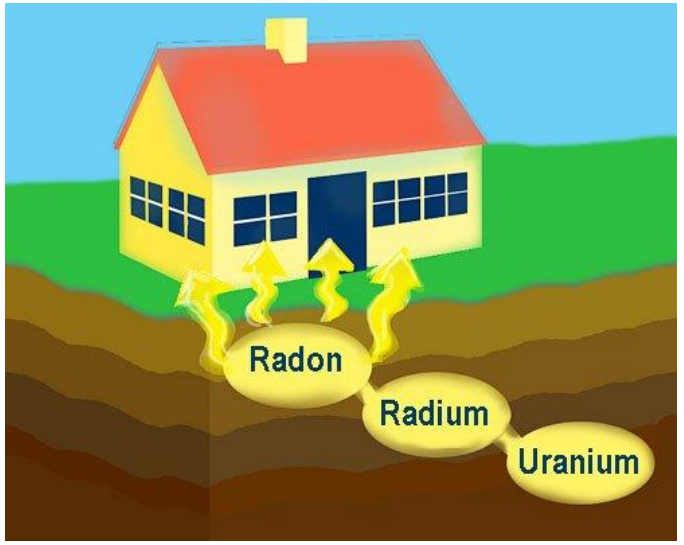
A layman's description

- Radon is a cancer-causing radioactive gas. You cannot see, smell or taste radon, but it may be a problem in your home. The Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today. If you smoke and your home has high radon levels, you're at high risk for developing lung cancer. Some scientific studies of radon exposure indicate that children may be more sensitive to radon. This may be due to their higher respiration rate and their rapidly dividing cells, which may be more vulnerable to radiation damage.

- http://www.radon.com/radon/radon_facts.html

Where does radon come from?

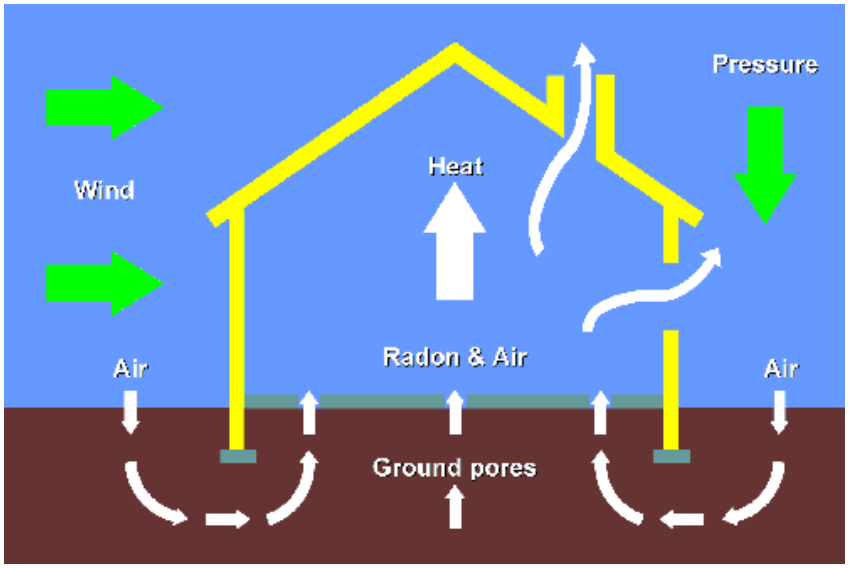
Radon comes from the natural radioactive decay of radium and uranium found in the soil beneath the house. The amount of radon in the soil depends on soil chemistry, which varies from one house to the next. Radon levels in the soil range from a few hundred to several thousands of pCi/L. The amount of radon that escapes from the soil to enter the house depends on the weather, soil porosity, soil moisture, and the suction within the house.



http://www.kansasradonprogram.org/faq

How does radon get into my home?

- Warm air rises. When this happens in your home, it creates a vacuum in the lower areas of the house. Nature hates a vacuum, so something must rush in to fill it. In the case of your home, air seeps in from the soil around and under the house, and some air is sucked in through openings (cracks, doors, windows) on the lower levels. Radon gas enters the same way air and other soil gases enter the home; through cracks in the foundation floor or walls, hollow-block walls, and openings around floor drains, pipes and sump pumps.

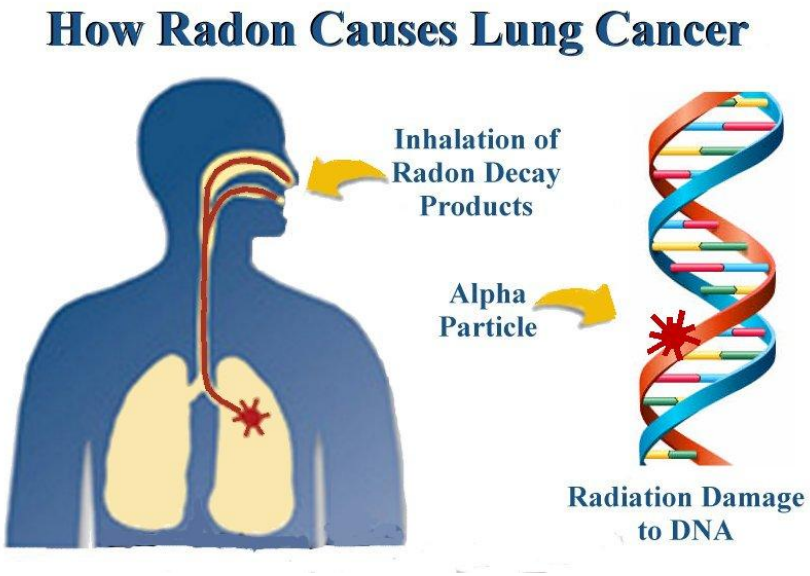


- http://lancaster.unl.edu/home/IndoorAir/radon.htm

What is the risk of radon exposure?

Scientists believe radon exposure is the second leading cause of lung cancer. When radon decays, it shoots off alpha particles. These are small, heavy, electrically charged, sub-atomic particles consisting of two protons and two neutrons. If an alpha particle strikes the chromosomes in a lung cell, it could alter the way that cell reproduces. Our body's immune system should recognize and destroy these mutant cells before they can multiply over the next 10 to 20 years into a recognizable cancerous growth. Some people's immune systems are better than others. Because of these inherent differences, radon doesn't affect everyone the same.

http://www.kansasradonprogram.org/faq



I am a smoker. Does radon affect me more than a non-smoker?

Yes. The risk from radon exposure for a smoker (including those exposed to second hand smoke) is much greater than for a non-smoker. For example, if you are a lifelong smoker but are not exposed to radon, your risk of getting lung cancer is one in ten. If you add exposure to a high level of radon, your risk becomes one in three. On the other hand, if you are a non-smoker, your lifetime lung cancer risk at the same high radon level is only one in twenty.

http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/faq_fq-eng.php#reaction

Are children more at risk from radon than adults?

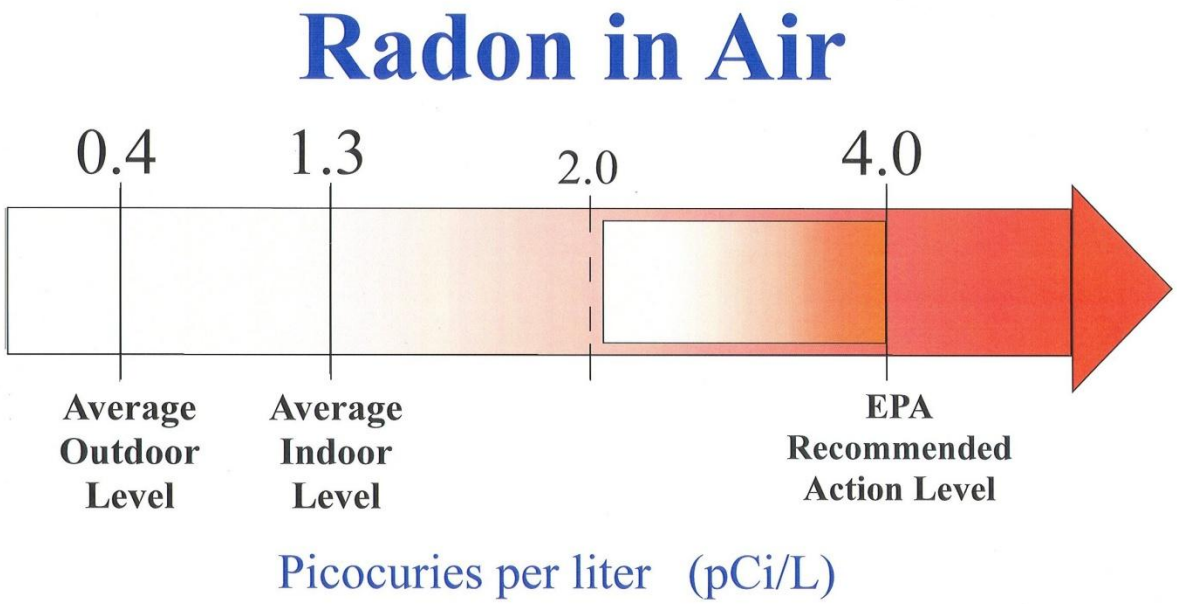
Children have been reported to be at greater risk than adults for certain types of radiation exposure, but there is currently no conclusive data on whether children are at greater risk than adults from radon.

http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/faq_fq-eng.php#reaction

What does pCi/L mean?

PicoCuries per liter (pCi/L) is a unit for measuring radioactive concentrations. Pico is a scientific notation in the metric system denoting a factor of 10^{-12} (or one trillionth). The curie (Ci) unit is the activity of 1 gram of pure radium-226. One pCi is one trillionth of a Curie, 0.037 disintegrations per second or 2.22 disintegrations per minute. Therefore, at 4 pCi/L (the EPA's recommended **action level**), there will be approximately 12,672 radioactive disintegration's in one liter of air during a 24-hour period.

- http://www.doh.state.fl.us/environment/community/radon/radonFAQ.htm



Why is 4 pCi/L the recommended action level for Radon?

EPA recommended this mitigation action level in 1986 for several reasons. First, at lower levels (2 pCi/L), false negative errors in radon measurement devices increase threefold and false positive errors increase twofold. Secondly, mitigation research indicates that elevated levels can be reduced to 4 pCi/L or less 95% of the time. Research also indicates that 2 pCi/L can be achieved 70% of the time. Further, mitigation technology available today can reduce radon levels to between 2 and 4 pCi/L most of the time. Finally, cost benefit analysis performed in 1986 indicated that an action level of 4 pCi/L resulted in a cost of about $700,000 per lung cancer death saved. If the action level was set at 3 pCi/L, the cost would be $1.7 million, and if set at 2 pCi/L, the cost would be $2.4 million per lung cancer death saved. EPA states that 4 pCi/L is a recommended action level, but homeowners can further reduce their lung cancer risk by mitigating homes that are below 4 pCi/L.

http://www.doh.state.fl.us/environment/community/radon/radonFAQ.htm

How do I test my home for radon?

There are **two** options for testing your home for radon:

- Option 1: Purchase a do-it-yourself radon test kit. Kits can be purchased from the Bernalillo County Office of Environmental Health for $5.00 and from home improvement retailers. The radon test kits will include instructions on how to set up the test and send it back to a lab for analysis once the testing period is over. The kits that Bernalillo County uses include the cost of analysis and postage.
- Option 2: Hire a radon measurement professional. In New Mexico, measurement professionals are required to be registered. Check this website for a registered professional near you:

- http://www.nmenv.state.nm.us/nmrcb/documents/Registered_Measurement_Providers10a_doc.pdf

Where in the house or building should I perform the test?

To provide a realistic estimate of the radon exposure of the occupants, all measurements should be made in the normal occupancy area of the lowest lived-in level of the house. The normal occupancy area is defined as any area occupied by an individual for more than 4 hours per day.

Potential measurement locations include family rooms, living rooms, dens, playrooms and bedrooms. A lower level bedroom is preferred because people generally spend more time in their bedrooms than in any other room in the house. Similarly, if there are children in the house, lowest level bedrooms or other areas such as a playroom are preferred.

http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/faq_fq-eng.php

I don't have a basement. Do I still need to test my house for radon?

Radon can get into a house from anywhere that the house is in contact with the ground, regardless of whether your house has a basement, a crawl space or is built slab-on grade.

http://www.ncradiation.net/Radon/faq.htm

Are test kits for measuring radon gas accurate?

Yes. The largest source of error in radon testing does not come from the type of device used, but rather from the failure to maintain appropriate closed house conditions during the period of the test. It is important to carefully follow test kit instructions if you want accurate results. The accuracy of almost all commercially available radon measurement devices has been evaluated in the Environmental Protection Agency's (EPA) Radon Measurement Proficiency Program (RMP). This program exposed the devices to established radon levels and returned them to the company or individual for evaluation. A minimum passing requirement was that the result must have been within plus or minus 25% of the established radon levels. Most devices have better performance at the EPA guideline level of 4 picocuries per liter of air. Laboratories and measurement service providers have quality assurance programs and controls to maintain reliable performance and accurate results.

http://www.kansasradonprogram.org/faq

How is radon removed from homes?

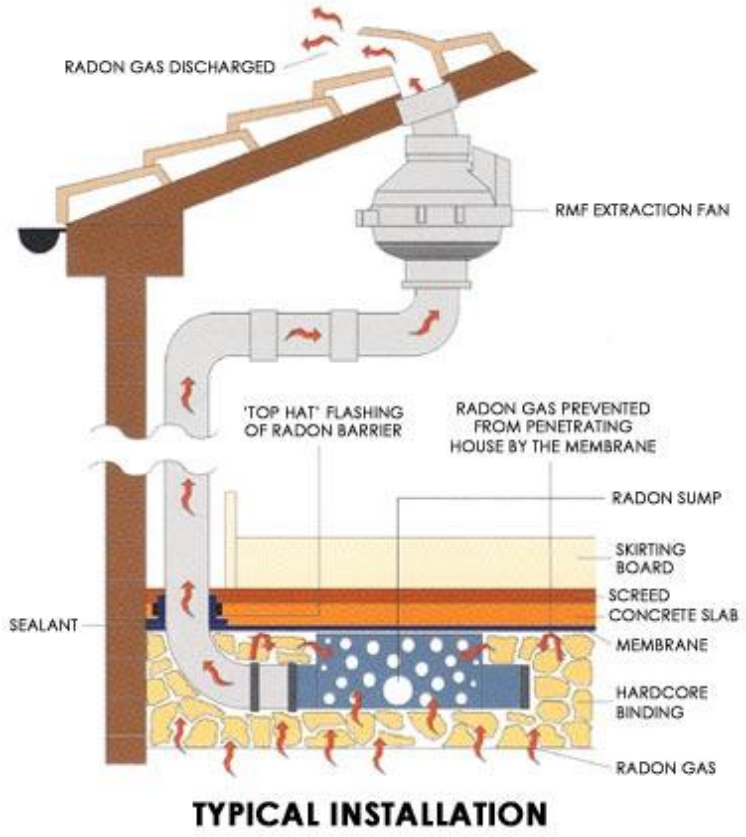
The primary method of radon reduction (or mitigation) involves the installation of an Active Soil Depressurization (ASD) system. An ASD system involves the installation of a venting system that removes radon gas from the soil beneath a house's foundation. The system includes a 3- to 4-inch PVC vent pipe, a continuously running suction fan and a system indicator. The PVC vent pipe is installed through the foundation into a small pit that is dug out by hand through the insertion hole (which often has to be drilled out). The pipe is then routed either up through the house and exited through the attic and the roof or routed to the exterior of the house and up the wall with the terminus above the eave line of the house. If the vent pipe is routed through the house, the suction fan is usually installed in the attic. If the vent pipe is routed up the outside of the house, the fan is mounted near ground level. The system indicator is mounted at some visible location below the suction fan. Most systems use a simple U-tube manometer to indicate that suction is being exerted in the pipe by the suction fan. ASD systems can be adapted for use with all foundation types (basement, slab-on-grade, crawl space, or mixed foundation types) and is the most cost-effective and most efficient means of reducing elevated indoor radon.

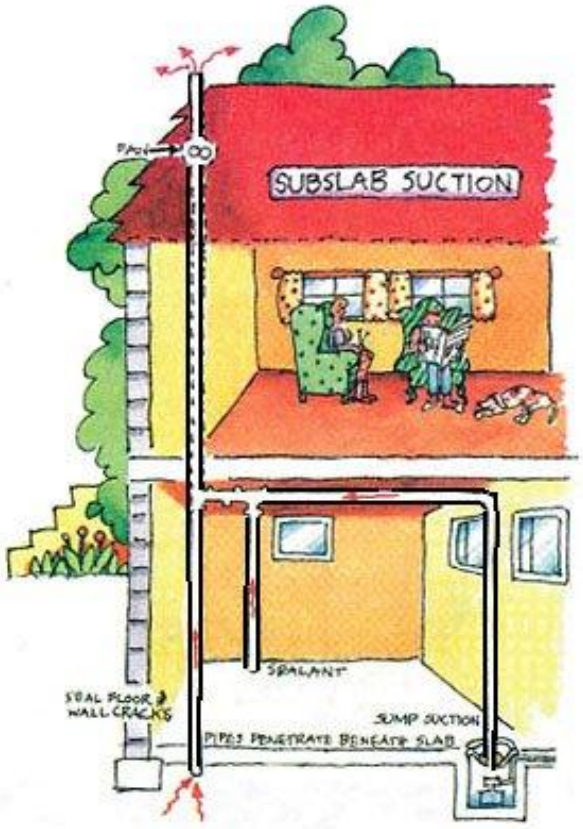
http://www.kansasradonprogram.org/faq

How much will it cost to mitigate my house?

The cost of reducing radon in your house depends on how your home was built and the extent of the radon problem. The average radon remediation cost when using a contractor is $1500 - $3000. The cost is much less if you can do the work yourself or if a passive system was installed during construction.

http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/faq_fq-eng.php#cost





Where can I find a contractor for radon mitigation?

The New Mexico Radiation Control Bureau maintains a list of licensed professionals on their website:

http://www.nmenv.state.nm.us/nmrcb/radon.html

How do I check my contractor's work?

- The following website has excellent guidance on what to look for if you hire a radon mitigation contractor:

- http://www.cdph.ca.gov/HealthInfo/environhealth/Pages/RadonFix.aspx

What factors should I look at in deciding whether to mitigate or not?

- Cigarette smokers should keep their exposure to radon as low as possible. Smokers have eight times the risk from radon as non-smokers.
- If the house was tested in an infrequently used basement, it may have measured a radon level that is higher than the actual level you are exposed to, spending most of your time upstairs.
- People with young children should be more concerned with the possible consequences of radon exposure 20 years from now than someone in their late sixties or seventies.
- Families with a hereditary predisposition of cancer should be more concerned about radon exposure than families who don't have any history of cancer.
- If you work for a company that might transfer you in the future, your employer probably will hire a relocation company to purchase your home. Today, most relocation companies insist that the house test below 4 pCi/L before they will buy it.
    - http://www.kansasradonprogram.org/faq

I am building a new house, are there any building codes for radon protection?

Appendix F of the 2006 International Residential Code (IRC): Radon Control Methods

ASTM E1465-08: Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings; and

Section 49.2.5 of NFPA 5000TM: Radon Control Methods (The National Fire Protection Association's Building Construction and Safety Code)

http://www.epa.gov/radon/rrnc/buildingcodes_primer.html#which codes

I am building a new house, can I have the site tested for radon?

Soil testing for radon is not recommended for determining whether a house should be built radon-resistant. Although soil testing can be done, it cannot rule out the possibility that radon could be a problem in the house you build.

http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/faq_fq-eng.php

Does Radon break down and disappear from a building?

Radon does decay (break-down); however, the ability for any given patch of land to produce a radon problem in a building placed on it is effectively constant during your life time.

Radon 222 is a radioactive element in the Uranium 238 decay chain. The 'parent' element to radon is Radium 236. While radon has a half-life of 3.8 days and thus decays out rather quickly, Radium 226 has a half-life of 1620 years. Any radon in the ground is continually being replenished by the decay of the radium in the soil. With a half life of 1620 years, the amount of radium and the rate of radon production during an individual's life, or the design life expectancy of your average building, is effectively constant. Radon is constantly generated and available to enter and accumulate in buildings at high concentrations.

http://www.doh.state.fl.us/environment/community/radon/radonFAQ.htm